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ABSTRACT

Although returns to military service may have been positive prior to Vietnam, since Vietnam the average veteran has neither benefited nor suffered economically from military service. Educational attainment is the primary reason veterans have earned more than nonveterans. Because the population as a whole has become more educated, military service does not seem to carry much of an economic advantage for the average veteran. This generalization must be tempered for three groups of veterans. The military functions as a highly effective jobs and scholarship program for minorities. Evidence consistently shows veterans with less than a high school degree do better than dropouts who do not enlist. Veterans trained in technical specialties comprise a third group that benefits from military service because their skills transfer readily to the civilian economy. Military reductions may exacerbate shortages of trained technicians and craftspersons. Policy makers should consider placing the burden of reductions in force on nontechnical occupational specialties. Since the military functions effectively as a jobs and scholarship program for minorities and the poor, another policy issue is how to ensure educational benefits to those who would be unable to acquire further education with military service. In addition, policies ought to be fashioned to create alternative forms of employment. (Appendixes include 4 endnotes and 32 references.) (YLB)

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Will Military Reductions Create Shortages of Trained Personnel and Harm the Career Prospects of American Youth?

by

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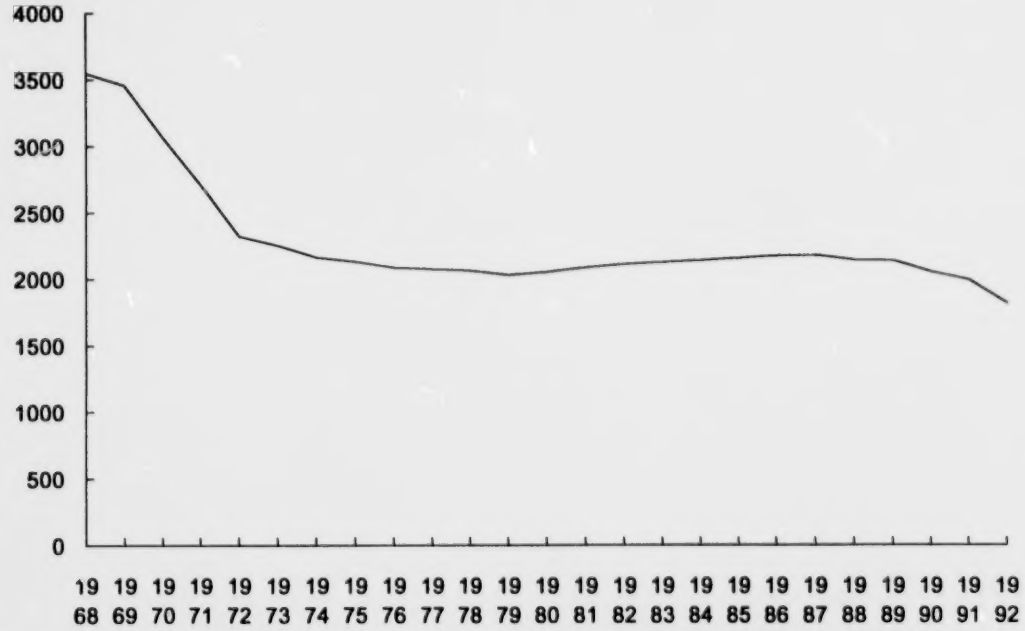
Introduction

Although the military does not serve society primarily as an educational institution, many Americans now view military service as a springboard to careers in the civilian economy. The perception is most likely rooted in the legendary economic success of the veterans of World War II. Not only were many returning veterans trained in lines of work valuable to the economic expansion that followed (Fredland and Little 1980), but the GI bill enabled many others to acquire a post-secondary education that further enhanced their economic prospects. In recent decades, the armed forces have consciously promoted enlistment as a way to invest in training relevant for later life. The fact that a sizable percentage of recruits cite career benefits as a reason for joining the military (Richardson 1967) testifies to the effectiveness of the campaign which highlights what may be the most unique aspect of military training: unlike schools, the military not only trains young people, it provides "students" with a salary and subsidizes additional training after "graduation."

With the end of the Cold War has come the decision to "downsize" the military. The American economy and the military are deeply entwined, therefore a reduction in military spending promises to create serious social and economic difficulties. The closing of military bases imperils the livelihood not only of the communities surrounding the bases but, in some cases, entire regions and states. Cutbacks in military procurement may bankrupt firms and even cripple entire industries for whom the Pentagon has been a primary customer. Reductions in force also imply fewer opportunities for 18- to 24-year-old youth at a time when unemployment is already high. Finally, if military training does prepare individuals for civilian jobs, then reductions in force may constrict the availability of trained personnel just as firms have begun to realize that they require a workforce more skilled than in the recent past (Parnell 1985; Johnston and Packer 1987; Aerospace Education Foundation 1989).

Reductions in military force are not new. As Figure 1 indicates, the size of the American military declined steadily from the height of the Vietnam War in 1968 until 1979. Between 1980 and 1987 the military slowly added 124,000 more troops. Since then, however, the

Figure 1
Number of Active Duty Military Personnel: 1968-1992
(in thousands)



Data Source: Department of Defense. (1992) . Selected Manpower Statistics. Pp. 59-61.

military has again been steadily shrinking. Nevertheless, the armed services still recruit and discharge a sizable number of young people annually. In 1992, 186,000 individuals joined the military and 105,776 were discharged (Department of Defense 1992, 103). The latter figure is equivalent to 17 percent of all students who graduated in 1991 from all training programs of less than four years' duration in American institutes of higher education.[1]

Three questions must be answered before one can determine how to offset the potential loss of training opportunities for young people and the consequent shortage of skilled personnel that may be caused by military reductions. Of initial concern is whether veterans actually fare better in the civilian economy than they would have had they not served and, if so, why? Veterans may fare better than non-veterans for several reasons. Most obvious is that veterans acquire technical skills relevant for civilian jobs while serving in the military. The military may also inculcate social skills that employers value: for instance, punctuality, obedience, reliability, and other attributes glossed by the term "comportment." Alternately, veterans may fare better in the labor market not because of skills they

acquire, but because employers use military service as a credential for screening job applicants. All else being equal, employers may prefer veterans over non-veterans because they view military service as a sign that an individual has passed a test of character. Finally, military service may benefit veterans and the economy as a whole simply because it keeps late adolescents out of the civilian labor market until they have matured sufficiently to hold a responsible job, a function also served by colleges and universities. The formulation of adequate policy in the face of military reductions depends on which forces operate.

If evidence supports the claim that veterans enjoy economic returns to military service, one must then ask: which veterans benefit most? Conceivably, all veterans may enjoy returns from military service, although this seems unlikely since no other form of education confers benefits equally. A more plausible scenario is that some veterans benefit more than others. At issue, then, is the identity of the groups that benefit and their relative numbers. Only after policy makers have verified the existence of returns to military service, understood the causes of such returns, and identified the groups that benefit, can they formulate reasonable strategies for addressing the deleterious consequences of military cutbacks on the labor force.

This paper seeks to inform the debate on military reductions by examining the evidence for returns to military service in the civilian economy. The objective is to identify the dynamics that enable veterans to do better in the civilian economy and the groups of veterans that benefit most. The paper concludes by considering policy options that are consistent with the evidence on the civilian effects of military service.

Evidence of Civilian Returns to Military Service

Most studies of economic returns to military service fall into one of three categories defined by the outcomes that researchers have examined. The largest category consists of studies that compare the civilian earnings of matched samples of veterans and non-veterans. Most of these studies have sought to confirm or disconfirm the existence of returns to military service, although they also offer insights into the mechanisms that underwrite returns. The second category consists of studies which assume that technical training is the primary source of a veteran's edge in the civilian economy. One line of research asks whether differences in the earnings of veterans and non-veterans can be attributed to military training rather than to military service, *per se*. Another concerns the probability that a veteran will continue in the occupation for which he or she received military training and, if so, whether continuing affects earnings. Finally, a handful of studies have asked whether military service affects the probability of being employed.

The Effect of Military Service on Earnings Potential

Studies of the earnings of veterans and non-veterans usually employ regression models to predict whether military service raises or lowers hourly wages or annual salaries after controlling for other factors correlated

Table 1

Summary of Empirical Assessments of the Effect of Military Service on Civilian Earnings by War and Race*

Article	Date	WWII			Korean			Vietnam			Post-Vietnam		
		A	W	M	A	W	M	A	W	M	A	W	M
Villemez and Kasarda	76		+	+		+	+		–	–			
Martindale and Poston	79		+	+		+	+		–	+			
DeTray [1]	82		+	+		+	+		–	0			
Rosen and Taubman	82	+			+				–				
Fredland and Little [2]	80	0											
Angrist and Krueger	89	–	–	–									
Knapp [3]	76				+								
Schwartz	86				0	0	0	–	0	0			
Berger and Hirsch	83							–	0	0			
Angrist	90								–	0			
Cohany	92							0	0	+			
Crane and Wise	87										–	–	–
Mangum and Ball [1]	89										0		
Bryant and Wilhite	90										–		

KEY:
A = All Veterans
W = White Veterans
M = Minority Veterans
\+ = veterans earn more than non-veterans
– = non-veterans earn more than veterans
0 = no difference between veterans and non-veterans

* Unless otherwise noted, effects reported are those estimated before controlling for education or Military Occupational Specialty

1 Although DeTray did not control for war, he calculated coefficients for returns to military service for a number of birth cohorts. Therefore, it is possible to assign effects to wars from DeTray's data.

2 Return to military service calculated after controlling for Military Occupational Specialty.

3 Although Knapp does not explicitly control for the war in which veterans served, because he sampled veterans who were 18-32 in 1964, most would have served either in the Korean war or the period between Korea and the very early years of Vietnam. Hence, I have treated Knapp's study as a study of Korean War vets.

with income. The dominant finding that emerges from this stream of research is that returns to military service have declined since World War II. A systematic examination of the literature suggests, however, that "decline" may be an understatement: earnings differences may have become negligible, if not negative.

Table 1 summarizes by war and race the results of 14 studies conducted since the mid-1970s on returns to military service.[2] A "+" in a table cell indicates that the study found that veterans earn more than non-veterans. A "–" indicates the reverse. Findings of no difference are denoted by an entry of "0." When a study does not assess the earnings of veterans of a particular war or racial group, the corresponding cells remain empty.

A casual glance at the pattern of entries reveals that most of the evidence for positive returns to military service comes from research on veterans of World War II and Korea. Studies of veterans who served during or after Vietnam almost universally report that veterans

earn the same or less than their civilian counterparts. Of 17 positive findings, only two involved veterans who served during or after Vietnam. Conversely, all but three of the 15 findings of negative returns have involved veterans of Vietnam or the post-Vietnam era. Evidence that military service has no effect on civilian earnings is also found predominantly (69 percent) in studies of recent cohorts.

Thus, the pattern in Table 1 strongly suggests that civilian returns to military service since Vietnam have been, at best, negligible and possibly negative. Estimates of the cost of military service to a newly discharged veteran range from an 11 percent (Crane and Wise 1987) to a 19 percent (Rosen and Taubman 1982) reduction in earnings. Bryant and Wilhite (1990) estimated that military service costs the average veteran approximately 85 cents per hour.

Nevertheless, Table 1 indicates that the loss of returns may have been less severe for minorities. Martindale and Poston (1979) found that black Vietnam veterans continued to enjoy a premium for military service even though whites did not. Martindale and Poston note, however, that the premium was much smaller than that experienced by blacks who served in earlier wars. Cohany (1992), who based her estimates entirely on differences in mean salaries rather than on regressions, reported that black Vietnam veterans earned approximately 25 percent more annually than did blacks of the same age who did not serve. DeTray (1982) and Angrist (1990) found negative returns to service for white Vietnam veterans but relative parity among black veterans and non-veterans. Villemez and Kasarda (1976) reported negative returns for both groups but remarked that the disparity between minority veterans and non-veterans was much less than that experienced by their white counterparts. Crane and Wise (1987), who examined data on post-Vietnam veterans, reached the same conclusion. They estimated that a year in a civilian job brought a white male a 7 percent increase in annual earnings, while a year in the military brought only a 3 percent increase. For blacks, the difference was less severe: an 8 percent increase for a year in a civilian job versus a 7 percent increase for a year in the military.

The patterns in Table 1 raise two questions: why have returns to military service dwindled since Korea and why has the decline been less severe for minorities? Three explanations seem plausible. First, the demise of positive returns may reflect *dynamics of selection*. Veterans of World War II and Korea may have possessed attributes that would have made them more attractive to employers regardless of their service. A similar distinction may continue to be true of minorities in the military. Alternately, the pattern of declining returns may reflect the presence of *moderating variables*. Trends in society associated with, but distinct from, military service may conceivably explain positive returns before Vietnam, negative returns after Vietnam, and the greater severity of the change for whites. Shifting patterns of educational attainment are a primary candidate for such a moderating variable. Finally, the pattern in Table 1 may reflect *changes in culture*, in particular the declining prestige of military service in American society. A number of researchers have argued that Vietnam-era veterans suffered from an unpopular war and that images of the Vietnam veteran were not as positive as images of the World War II veteran (Martindale and Poston 1979; Schwartz 1986). Studies of more recent cohorts of veterans suggest, however, that if military service is perceived differently than in the past, the effect is not specific to Vietnam. As a group, the studies in Table 1 enable us to evaluate

these explanations, while also assessing the mechanisms that may underwrite returns to military service in general.

Selection Dynamics. In an influential study, DeTray (1982) found positive returns to military service before Vietnam by dividing samples drawn from the 1960 and 1970 Census into relatively narrow age cohorts. DeTray then regressed the percentage of veterans in each cohort onto coefficients indicating the rate of return for the cohort. DeTray discovered that returns to military service were directly proportional to the percentage of veterans in the cohort. He interpreted this result as evidence for a screening dynamic based on selection differences. DeTray argued that the larger the proportion of a cohort who served in the military, the more employers would assume that non-veterans were somehow inferior because they were more likely to have been rejected by the military.

Angrist's and Krueger's (1989) study of World War II veterans offers stronger support for the thesis that selection dynamics are responsible for different patterns of economic returns before and after Vietnam. Angrist and Krueger note that a larger percentage of American males were mobilized in World War II than in any other war. Men who did not serve were often deemed unfit for medical, psychological, or social reasons. Thus, when forced to compare the average veteran and non-veteran, employers might well have believed that a veteran would be a more "desirable" employee along a variety of dimensions including intelligence, education, and socio-economic status. Because men were drafted during World War II by date of birth, those born earlier in the year were more likely to serve than those born later in the year. Angrist and Krueger used birthdates to distinguish between groups of men whose probability of being drafted differed. Since dates of birth are unlikely to be correlated with personal attributes, the procedure allowed Angrist and Krueger to estimate returns to military service while controlling for individual differences based on selection criteria. After controlling for the risk of being drafted, Angrist and Krueger found that "veterans earn no more than comparable non-veterans and may well earn less" (p. 1). Angrist and Krueger attributed their discovery of negative returns to military service among World War II veterans to the fact that draftees did not benefit from the continuous civilian employment enjoyed by those who did not serve. Angrist and Krueger conclude that veterans of World War II and Vietnam probably experienced similar economic returns to military service: both negative.

In light of Angrist's and Krueger's findings, it is instructive to note that Crane and Wise (1987) report that the academic ability of enlistees since Vietnam does not differ from that of high school graduates who go neither to college nor to the military. In other words, selection dynamics do not appear to affect their sample either. Perhaps it is for this reason that they, like Angrist and Krueger, find consistently negative returns to military service.

The foregoing studies provide relatively direct evidence for the possibility that declining returns to military service are byproducts of selection dynamics associated with period effects and draft procedures. In contrast, no direct evidence is available that would allow one to conclude that selection differences also explain why returns have declined less severely for minorities. However, indirect evidence is available. A number of studies have shown that even when returns to military service are negative, veterans without a high school education earn more than non-veterans who have not completed high school (Villemez and Kasarda 1976; DeTray 1982; Rosen and Taubman 1982; Berger

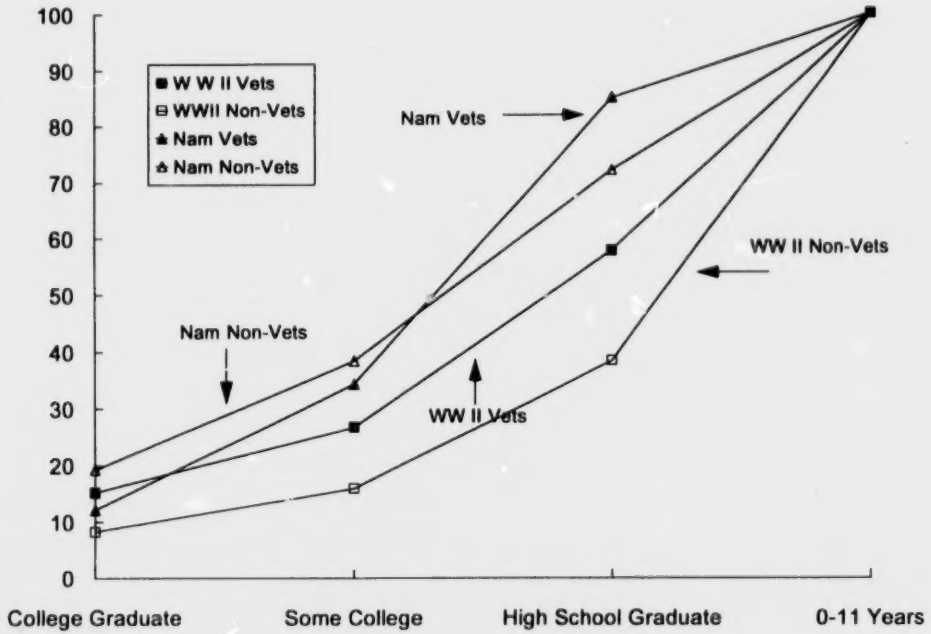
and Hirsch 1983; Cohany 1992). It is also the case that minority veterans are, on average, less well educated than white veterans (Villemez and Kasarda 1976; Cohany 1990). Berger and Hirsch (1983), suggest that high school dropouts who enter the military may have an advantage over other dropouts because the military is particularly careful when screening applicants from this population: they induct only the most capable. If Berger's and Hirsch's conjecture is accurate, then minority veterans may experience an advantage relative to non-veterans not only because they are more able than their peers but because their veteran status signals their ability to employers.

Education as a Moderating Variable. To the degree that selection dynamics account for the pattern in Table 1, returns to military service are best viewed as the product of attributes possessed by veterans prior to enlistment or conscription. Military service adds no human capital. In contrast, the argument that education moderates returns to military service draws attention to increments in human capital that are usually acquired after military service. In this case, military service may indirectly enhance human capital. The hypothesis that declining returns to military service can be explained by an association between military service and educational attainment rests on three entwined propositions: (1) that earnings increase with increasing education, (2) that veterans, on average, acquire more education than non-veterans, and (3) that differences in the educational attainment of veterans and non-veterans have diminished over time. The first proposition is so well established that it requires no further documentation. The argument therefore pivots on the viability of the second and third propositions.

There can be little doubt that large numbers of veterans of World War II eventually profited by taking advantage of the educational benefits associated with the GI Bill. O'Neill, Ross, and Warner (1976) report that 51 percent of all World War II veterans eventually used the GI Bill to obtain some form of training. Twenty-six percent of all veterans of World War II attended at least one year of college, whereas only 14 percent of the non-veteran population were similarly well educated.[3] Richardson (1968), who studied veterans discharged from the Air Force in 1965, and Mangum and Ball (1987), who studied post-Vietnam veterans, also reported that approximately 25 percent of their samples pursued additional education after military service. In fact, O'Neill, Rose, and Warner (1976) have shown that use of GI Bill benefits has increased since World War II: by the Vietnam era, 59 percent of U.S. veterans were using their educational benefits.

In recent years minorities have apparently taken greater advantage of the military's educational benefits than have whites. After controlling for ability (using the Armed Forces Qualification Test) and level of education pursued, O'Neill, Rose, and Warner (1976) found that black Vietnam veterans were between 4.5 percent and 9.9 percent more likely than whites to make use of the GI Bill. Moreover, blacks were more likely to use their benefits for college and vocational and technical schools, whereas whites were more likely to use their benefits for on-the-job training. Cohany (1992) also found that minority veterans were more likely than white veterans to avail themselves of educational benefits and that both black and Hispanic veterans were more likely than comparable non-veterans to pursue some form of post-secondary education (51.6 percent versus 26.5 percent for black and 60.6 percent versus 20.8 percent for Hispanic veterans and non-veterans respectively).

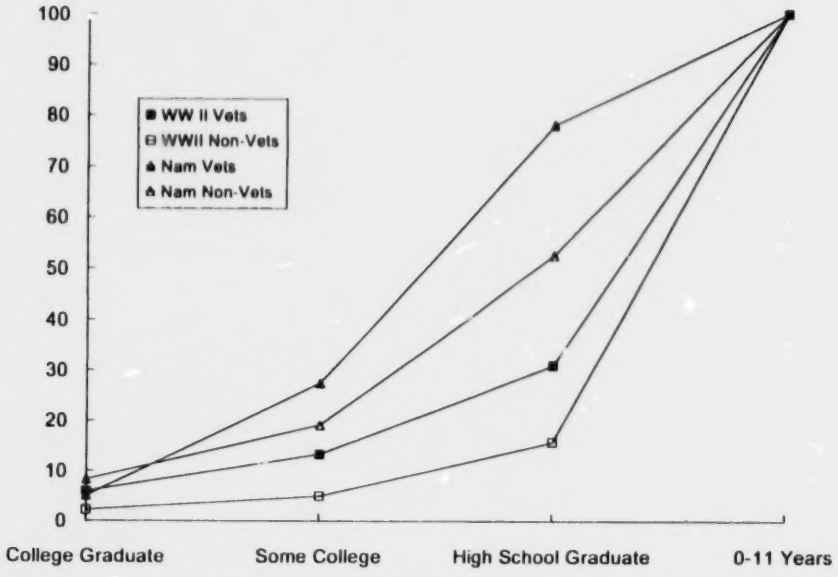
Figure 2
Cumulative Percentage of White Veterans of World War II and Vietnam with Various Levels of Education



Thus, data generally confirm the proposition that veterans acquire more education than comparable non-veterans and that the acquisition generally occurs after discharge. This suggests the possibility that differential educational attainment largely explains economic returns to military service. Villemez and Kasarda (1976) explicitly put this hypothesis to test. In a path analysis designed to predict income, Villemez and Kasarda (pp. 416-417) found that the direct effect of military service on earnings was small and that the indirect effect through occupation was "practically nonexistent." Military service was, however, a strong predictor of educational attainment and educational attainment was even more strongly predictive of income. Hence, Villemez and Kasarda concluded that returns to military service were almost entirely explained by the fact that veterans pursued more education. Moreover, Villemez and Kasarda found that the indirect effect of military status on earnings though education was stronger for blacks than for whites.

If veterans have always become more educated than comparable non-veterans, then why have returns to military service diminished through time? The paradox appears to be explained by the fact that since World

Figure 3
Cumulative Percentage of Minority Veterans of WWII and Vietnam with Various Levels of Education



War II, levels of education have increased throughout American society, thereby reducing the competitive edge that veterans once acquired from the GI Bill. Figures 2 and 3 which are based on data reported by Villemez and Kasarda (1976) lend credence to what they call the educational "tipping point". Figure 2 displays the cumulative frequencies of white veterans and non-veterans from World War II and the Vietnam era who obtained successively lower levels of education. Figure 3 provides similar data for minorities.

The line for white World War II veterans in Figure 2 is consistently higher than the line for comparable non-veterans. Thus, white World War II veterans were consistently better educated than white non-veterans regardless of the level of education that is used as a reference point. However, the line for white Vietnam veterans initially lies below that of non-veterans: non-veterans were more likely to have obtained four-year as well as two-year degrees. Thus, even after taking advantage of the GI Bill, white Vietnam veterans were as a group less well-prepared than their counterparts who did not serve, in part because they used the GI Bill to obtain vocational and on-the-job training rather than a two- or four-year degree. Figure 3 tells a

similar story for minorities, with the important exception that only college degrees were more common among minority non-veterans in the Vietnam era. Thus, by using the GI Bill to acquire post-secondary education, minority Vietnam veterans gained more of an economic edge over their civilian counterparts than did their white comrades.

Thus, it appears that differences in educational attainment and educational trends in society may account for the pattern of declining returns to military service for most of the observed differences in earnings among veterans and non-veterans and for the fact that black veterans have been less severely affected than whites.

Changes in Culture. Although several researchers have proposed that diminishing returns to military service reflect shifting social attitudes toward the role of the military in society (Martindale and Poston 1979; Schwartz 1986), no study has directly assessed the relationship between cultural change and the earnings of veterans and non-veterans. Although it seems likely that Vietnam veterans may have suffered from the effects of an unpopular war, later veterans have not confronted the same social dynamics. In fact, perceptions of military service may have improved in recent years. Yet, as Table 1 indicates, the earnings pattern of more recent veterans is quite similar to that of Vietnam veterans. Given the evidence for selection dynamics and the especially strong evidence that educational attainment moderates returns to military service, a cultural explanation is likely to rank a distant third.

The Effects of Military Training and Occupational Specialty

Training. Because earnings are so strongly tied to education, it seems plausible that military service should most enhance civilian wages when veterans acquire skills in the military that are of direct value in the civilian economy. For this reason, a number of researchers have attempted to distinguish payoffs to military training from payoffs to military service itself. Using data on World War II veterans, Fredland and Little (1980) reported that military training brought a 12 percent premium in earnings if a veteran used his or her training in the civilian economy. Norrblom (1976) arrived at an identical estimate of the payoff for a year of military training using data on Vietnam veterans. Norrblom also found that military service was unrelated to earnings after controlling for whether veterans had received training in the military.

In a study of veterans who served after Vietnam, Bryant and Wilhite (1990) reached less optimistic conclusions than Fredland and Little (1980) or Norrblom (1976). Bryant and Wilhite regressed hourly wages on the time veterans spent in the military as well as on the number of months of military training they received. The regressions indicated that each month of military service reduced a veteran's civilian wages by four cents per hour. Since the typical veteran served 31 months, a tour of duty reduced civilian wages by a total of $1.24 per hour. In contrast, a month of military training enhanced civilian wages by 20 cents per hour. Because the armed forces provided the average veteran with 1.78 months of training, Bryant's and Wilhite's estimates imply that even those who received training experienced no payoff in later earnings.

Occupational Transfer. The weakness of such results is that simple measures of time spent in training ignore differences in occupation. It is unlikely that a person trained as a cook can expect the same career boost as a person trained in computer technology, even if both are trained for identical periods of time. Conse-

quently, returns to military training are likely to vary widely by occupational specialty.

Following this line of reasoning, a number of researchers have estimated the payoff to veterans who entered civilian jobs that matched their "military occupational specialty" (MOS) and have sought to identify those specialties where matches are most likely to occur (Norrblom 1976; O'Neill, Ross, and Warner 1976; Fredland and Little 1980; Mangum and Ball 1987, 1989; Bryant and Wilhite 1990). Three findings repeatedly surface. First, after controlling for matches between military and civilian occupation, all returns to military service and training disappear. Thus, civilian payoffs to military service are largely a function of the MOS in which a veteran is trained. Second, only veterans trained as technicians consistently appear to profit from their military training. Military personnel trained in electronics, the repair of electrical and mechanical equipment, and the crafts are most likely to find their training useful. Those who specialize in combat, communications or intelligence are least likely to find related civilian employment. Finally, a number of studies indicate that only training in the Air Force consistently yields positive returns (O'Neill, Ross, and Warner 1976; Mangum and Ball 1987; Bryant and Wilhite 1990).

One measure of the value of an MOS is the proportion of veterans who find civilian jobs in related lines of work. Norrblom (1976) and Mangum and Ball (1989) reported that approximately 50 percent of the veterans in their samples landed civilian jobs related to their MOS. Proportions were even higher for particular specialties. For instance, Mangum and Ball (1987) estimated that 61 percent of male military personnel trained in electronic equipment repair and in the crafts found similar jobs after being discharged. Although these percentages are large, it is difficult to gauge the extent to which a reduction in the number of persons trained in these specialties would affect the civilian economy unless one knows what percentage of each occupational group in the civilian economy received their training in the military and how the military performs compared to other providers of training.

Although behavioral data on sources of training for occupations are difficult to locate, a reasonable proxy is the percentage of persons in an occupation who report different sources of training as important for their work. Self-reported data on sources of training have been collected in a number of recent national surveys. Researchers at the National Center for the Educational Quality of the Workforce have compiled a "crosswalk" that compares the evidence from these surveys (National Center for the Educational Quality of the Workforce 1993). The crosswalk indicates that, on average, 2 percent of the population report having received military training. Yet for young males the rates are higher, ranging from 5 to 7 percent depending on the study.

In an appendix to an article on sources of training, Carey and Eck (1984) published self-reported data by detailed occupational group compiled from the January supplement of the 1983 Current Population Survey. Using this data one can assess the importance of military training for a variety of occupations. Although Carey and Eck also reported that only 2 percent of the working population thought their military experience was valuable training, the percentage rose to 5 percent for both "technicians and related support occupations" and "precision production, craft, and repair occupations." All other broad occupational groups reported less reliance on military training. That the military was most important in these occupational clusters concurs with the results of the studies of transfer of training discussed above. However, as Table 2 indicates, even

Table 2

Percentage of Members of Various Occupational Groups Who Report that Various Sources of Training Were Used in Obtaining Their Current Job*

(Rank of source's importance to occupational category in parentheses.)

OCCUPATIONAL GROUP	SOURCES OF TRAINING								
	High School	Voc-Ed	Jr/Tech College	College	Company Training	OTJ	Militar-y	Correspon-dence School	Friends
Executive, Administrative, Managerial	3 (6)	4 (5)	5 (4)	34 (2)	12 (3)	39 (1)	3 (6)	1 (7)	3 (6)
Professional Specialties	2 (7)	5 (5)	7 (4)	70 (1)	9 (3)	22 (2)	2 (7)	1 (8)	3 (6)
Technicians and Related Support	5 (6)	11 (5)	20 (3)	24 (2)	14 (4)	32 (1)	5 (6)	2 (7)	2 (7)
Sales	2 (5)	2 (5)	3 (4)	8 (3)	12 (2)	23 (1)	1 (6)	1 (6)	3 (4)
Administrative Support	16 (2)	5 (6)	8 (3)	6 (5)	7 (4)	31 (1)	1 (7)	1 (7)	1 (7)
Private Household	1 (4)	0	0	0	1 (3)	4 (2)	0	0	5 (1)
Service Workers	2 (6)	6 (3)	4 (4)	3 (5)	9 (2)	18 (1)	1 (8)	0	2 (7)
Farming, Forestry, and Fishing	2 (4)	1 (5)	2 (4)	4 (3)	1 (5)	16 (1)	0	0	11 (2)
Precision Production, Craft, and Repair	5 (4)	4 (5)	5 (4)	2 (6)	17 (2)	40 (1)	5 (4)	2 (6)	8 (3)
Operators, Assemblers, and Inspectors	3 (3)	2 (4)	2 (4)	1 (5)	6 (2)	26 (1)	1 (5)	0	3 (3)
Transportation and Materials Moving	1 (5)	1 (5)	0	0	8 (2)	26 (1)	2 (4)	0	5 (3)
Handlers, Helpers, and Laborers	1 (3)	0	1 (3)	0	2 (2)	13 (1)	1 (3)	0	1 (3)
TOTAL	5 (4)	4 (5)	5 (4)	17 (2)	10 (3)	28 (1)	2 (7)	1 (8)	3 (6)

* Data are based on Carey's and Eck's (1984) Table 1. Row percentages do not sum to 100 because respondents could indicate more than one source of training.

for the relatively technical occupational clusters, military training was among the least important sources of training. Far more important were on-the-job training, formal training sponsored by an employer, degrees from four-year colleges, and degrees from junior colleges and technical institutes.

The pattern is similar even when one examines less aggregated data. In only 34 of the 284 detailed occupations mentioned in Carey's and Eck's tables (1984) did more than 5 percent of the respondents claim that military training was useful "for qualifying for their current job." These 34 occupations are listed in Table 3 in order of the percentage of respondents who reported that military training was important. The table also reports the rank order of military service as a source of training for each occupation. In only one case, aircraft engine mechanics, was military training the most important source of training. In only two occupations was military training the second most important source of training: dentistry and "electronic repairers, commercial and industrial equipment." In most others, military training was either the third or fourth most important source of training. In general, only correspondence courses and friends were of less importance.

A measure of the relative standing of military training for an occupation can be derived from Carey's and Eck's data by calculating the ratio, P_m/P_f: where P_m is the percentage of respondents who report that military

Table 3

Occupations with More Than 5 Percent of Members Reporting Military Training Is Important

Occupation	Fercent	Source Rank
Aircraft Engine Mechanics	45	1
Data Processing Equipment Repairers	22	4
Electronic Repairers, Commercial and Industrial Equipment	21	2
Miscellaneous Electrical and Electronic Equipment Repairers	19	3
Electrical and Electronic Technicians	17	4
Aerospace Engineers	14	4
Construction Inspectors	12	3
Electricians	12	3
Water Transportation Occupations	12	3
Supervisors, Mechanics, and Repairers	11	3
Office Machine Repairers	11	4
Telephone Line Installers and Repairers	10	3
Electrical and Electronic Engineers	9	4
Bus, Truck, and Stationary Engine Mechanics	9	3
Inspectors and Compliance Officers, Except Construction	8	4
Industrial Engineers	8	4
Engineering and Related Technologists and Technicians	8	6
Mechanics and Repairers, Except Supervisors	8	4
Vehicle and Mobile Equipment Mechanics and Repairers	8	4
Electrical Power Installers and Repairers	8	3
Sheet-Metal Workers	8	3
Plant and Systems Operators	8	3
Engineers (not elsewhere classified)	7	5
Operations and Systems Researchers and Analysts	7	5
Heating, Air Conditioning, and Refrigeration Mechanics	7	6
Millwrights	7	4
Personnel and Labor Relations Managers	6	4
Management Analysts	6	5
Purchasing Agents and Buyers	6	5
Dentists	6	2
Firefighting and Fire Prevention Occupations	6	4
Police and Detectives	6	5
Guards	6	3
Automobile Mechanics	6	5

Table 4

Relative Importance of Military Training by Occupation

Occupation	Import Relative to 1st Source
Aircraft Engine Mechanics	1.00
Electronic Repairers, Commercial and Industrial Equipment	0.75
Data Processing Equipment Repairers	0.71
Miscellaneous Electrical and Electronic Equipment Repairers	0.63
Electrical and Electronic Technicians	0.44
Guards	0.30
Electricians	0.27
Telephone Line Installers and Repairers	0.27
Supervisors, Mechanics, and Repairers	0.26
Construction Inspectors	0.26
Inspectors and Compliance Officers, Except Construction	0.25
Office Machine Repairers	0.24
Electrical Power Installers and Repairers	0.24
Plant and Systems Operators	0.23
Water Transportation Occupations	0.23
Engineering and Related Technologists and Technicians	0.21
Mechanics and Repairers, Except Supervisors	0.21
Bus, Truck, and Stationary Engine Mechanics	0.21
Vehicle and Mobile Equipment Mechanics and Repairers	0.20
Aerospace Engineers	0.19
Millwrights	0.19
Sheet-Metal Workers	0.19
Heating, Air Conditioning, and Refrigeration Mechanics	0.18
Purchasing Agents and Buyers	0.16
Industrial Engineers	0.16
Operations and Systems Researchers and Analysts	0.16
Automobile Mechanics	0.16
Personnel and Labor Relations Managers	0.15
Firefighting and Fire Prevention Occupations	0.15
Electrical and Electronic Engineers	0.14
Management Analysts	0.14
Police and Detectives	0.14
Engineers (not elsewhere classified)	0.10
Dentists	0.06

Table 5

Percentage of Men and Women Reporting Skill Transfer by Source of Training*

Source of Training	Males		Females	
	Number	Percentage	Number	Percentage
Company/Employer	95	85%	62	82%
Barber and Beauty School	4	75	25	64
Apprenticeship	34	71	5	40
Nursing Program	6	67	32	59
Vocational/Technical Institute	125	52	90	61
Military	**535**	**50**	**276**	**46**
Correspondence School	45	27	40	15
Business College	18	22	47	55
Flight School	8	0	0	–
Other	45	47	52	56

* Data are drawn from Mangum's and Ball's (1989) Table 1. The sample consists of men and women in the National Longitudinal Study-Youth Cohort study who had either served in the military or who had completed more than 30 days of post-secondary training in civilian institutions by 1984.

training is an important source of training and P_f is the percentage of respondents who cite the occupation's most common source of training, whatever it might be. When the military is the most important source of training, the ratio attains a value of 1. When no members of an occupation claim that military training is important, the ratio assumes a value of 0. Table 4 lists the 34 occupations in Table 3 in order of their value on this ratio. The ratio falls off rapidly. By the time one accounts for the top 34 occupations, the ratio has fallen to .06. The list indicates that military training seems most important for aircraft mechanics and for those who operate or repair electronic or computational devices. In general, then, it would appear that military training is relatively unimportant outside of a handful of occupations and even in most of these, the military is neither a primary nor a secondary source of training.

Several studies have attempted to assess how people who obtain occupational training in the military fare relative to those who receive training elsewhere. Fredland and Little (1980) estimated that military training brought World War II veterans a 12 percent premium in wages but that comparable civilian training brought a premium of 16 to 17 percent. Veterans trained by the military in the skilled trades apparently enjoyed no premium for their training. Persons trained in the skilled trades in the civilian economy, however, received a return of 18 to 21 percent. Norrblom found that a year of military training brought a 12 percent return on wages. However, pre-service civilian training yielded a 16 percent return, and pre-service work experience in an occupation yielded another 7 percent. Thus, Norrblom's data indicate that civilian training may be worth at least 25 percent more than comparable training in the military.

Most civilian institutions appear to be as successful or more successful than the military in imparting skills that prove useful in the civilian labor force. Table 5 presents Mangum's and Ball's (1989) estimates of the percentage of men and women who find jobs in the area

in which they are trained by various sources of training. Although for men, the military was a more effective provider of training than correspondence courses and even business colleges, employer-sponsored training programs and apprenticeships were far more effective than military training. Military training and vocational and technical institutes appear to be about equally effective. For women, all sources of training except apprenticeship programs and correspondence courses were more effective than the military. Thus, the evidence on rates of return to training and the probability of finding a job in one's chosen occupation, strongly suggests that, all else being equal, young people should look to sources of training other than the military if they wish to optimize their careers.

The Effects of Military Service on Employment

All else, however, is rarely equal. Different sources of training may be unequally available (or even viable) for different groups of young people. For instance, there is reason to believe that the military may be a much more accessible source of training for the less privileged and for minorities, in particular. Although Crane and Wise (1987) found no difference between the ability of high school graduates who enlist and those who attended two-year colleges or entered the labor force, they reported that enlistees were more likely to come from poorer families and to be minorities. Blacks currently represent 16 percent of all enlistees but only 10 percent of the civilian labor force (Crane and Wise 1987). From 1969 to 1978 the percentage of white 18- to 24-year olds in the military fell from 20 percent to 7 percent, whereas the percentage of blacks in the military from the same age bracket remained constant at 14 percent (Ellwood and Wise 1987). Thus the military appears to be twice as important as an employer (and one would assume trainer) of young blacks as it is for young whites.

In fact, it appears that military service may significantly lower aggregate unemployment among black, but not white, youths. Ellwood and Wise (1987) estimated the effect of enlistment on civilian employment rates for young white and young black males. Although their estimate was statistically insignificant, they found that when a white male enlists in the military, civilian employment among young white males *falls* by .29 of an individual. When a young black male enlists, employment of black youth *increases* by 1. Thus, even if the military does not serve as an important source of training for black youth, it does represent a significant source of employment. Reductions in the armed forces may well increase the rate of unemployment among minority youth.

What Research Tells Us: Conclusions and Recommendations

Summary

Although returns to military service may have been positive prior to Vietnam, since Vietnam the average veteran has, at best, neither benefited nor suffered economically from military service. In fact, returns to military service, whether positive or negative, have probably never been related to military service itself. Conceivably, selection dynamics created an illusion that military service enabled World War II veterans to earn more than comparable non-veterans. It is more likely, however, that *educational attainment is the primary reason veterans have earned more than non-veterans in some eras and less in others.* As a result of the GI Bill and its later incarnations, veterans were simply more likely to pursue post-secondary education than persons who did not serve in the military. In recent years, the edge conferred by educational benefits has diminished because the population as a whole has become more educated. Having an associate's or a bachelor's degree no longer sets the average veteran apart from comparable non-veterans. Thus, military service does not seem to carry much of an economic advantage for the average veteran.

This generalization, however, must be tempered for three groups of veterans. First, *military service continues to be economically advantageous for minorities.* Minorities benefit from military service for two reasons. Because minorities take considerable advantage of the military's educational benefits and because the levels of education remain lower among minorities than among whites, minority veterans profit from military service because they eventually become more highly educated than peers who do not join the military. Minorities also benefit because military service seems to reduce unemployment among black youth. When a young black enlists, youth employment increases by one. When a young white enlists, youth employment remains constant. Thus, *the military functions as a highly effective jobs and scholarship program for minority youth.*

The second group that may benefit from military service are high school dropouts. *Evidence consistently shows that veterans with less than a high school degree do better than dropouts who do not enlist.* Why this occurs is unclear. Perhaps because the armed forces screen dropouts closely, military service may serve as a

credential for veterans without a high school degree. Alternately, because of the availability of educational benefits, dropouts who enter the military may be more likely to finish school than their civilian counterparts. Finally, dropouts who enter the military may be more likely to receive occupational training. Ultimately, however, the issue of why military service benefits veterans without a high school diploma is rapidly becoming moot: the proportion of enlistees without high school degrees has declined precipitously since Vietnam (Schwartz 1986). In 1992, only 2 percent of all enlisted military personnel had less than a high school degree (Department of Defense 1992).

Veterans trained in technical specialties related to computers, electronics, and the repair of electrical and mechanical equipment comprise a third group that benefits from military service because their skills transfer readily to the civilian economy. The armed forces train approximately 5 percent of the persons who pursue such occupations in the civilian economy. If 50 percent of all veterans make use of their military training as Norrblom (1976) and Magnum and Ball (1989) report, and if one also assumes that most veterans who use their training have had a technical MOS, then in 1991 the military may have trained as many as 53,000 new entrants in the civilian labor force.[4] This number is roughly equivalent to 8 percent of all students who graduate annually from institutions of post-secondary education that offer less than four-year degrees. Nevertheless, the military may not be the optimal source of training even for people in these occupations. Civilians trained by other institutions are just as likely to secure work related to their training, and their earnings are likely to be greater, at least during the early years of their career.

Finally, it seems that Air Force veterans benefit more from military training than do members of the other armed services. Navy personnel are second most likely and Marines the least likely to benefit from either military training or service. The Air Force offers an edge not only because it has historically been the most technical of the services but because the average Air Force veteran scores higher on tests of ability than do veterans of the other armed services (General Accounting Office 1990).

Policy Considerations

On the basis of existing research, there seems to be little reason to anticipate broad shortages of trained labor because of reductions in military force. *Yet military reductions may exacerbate shortages of trained technicians and craftspersons,* since technical jobs are growing more rapidly than any other occupational sector and since shortages already exist in numerous technical specialties (Barley 1991). Whether policies are required to offset such shortages depends on the vulnerability of technical military occupational specialties. Given the increasingly technological nature of warfare, it would seem unwise for the military to target technical specialties for heavy reductions. All else being equal, reductions are more likely to come from non-technical specialties which impart skills that transfer less well to the civilian economy. Nevertheless, *if policy makers wish to minimize the effect of military cutbacks on shortages of trained personnel in the civilian economy they should consider placing the burden of reductions in force on non-technical occupational specialties.*

Although the military may not be as important a source of training as is sometimes intimated, one should not conclude that the military has no broad effects on civilian labor markets. The educational benefits that the military provides to veterans after discharge appear to matter a great deal. Because of these

benefits, black veterans, in particular, have attained levels of education that they otherwise might not have been able to afford. Thus, *military cutbacks may indirectly cause a shortage of trained civilians by reducing educational opportunities for those segments of the population least likely to have alternative means of financing an education.*

Given that the military functions effectively as a jobs and scholarship program for minorities and the poor, *the primary policy issue facing those concerned with the labor implications of military reductions is how to ensure educational benefits to those who would be unable to acquire further education without military service.* Policy makers might consider programs for inducing minorities to complete high school and to pursue some form of post-secondary education. Post-secondary education should not, however, be construed solely as attendance at an established educational institution. Research shows that many veterans use their benefits to pursue on-the-job training (O'Neill, Ross, and Warner 1976) and that such forms of training are potentially the most effective even in technical occupations (Barley 1993). In fact, it may be that the hands-on knowledge obtained by technical specialists in the military that makes them attractive to employers.

Subsidies for post-secondary education might cost less per person than the cost of supporting a serviceman or woman for an entire tour of duty. Such an approach, however, is likely to encounter several difficulties. First, some political factions will undoubtedly frame such a program as an "entitlement" and hence oppose any government effort to support the education of minorities in lieu of some form of service. Second, and perhaps even more troubling, such programs may be unattractive to those who would benefit most. Research by Portes and Stepick (1993) indicates that educational attainment may be less highly valued than military service in some minority youth cultures.

Policy makers may have several options for circumventing such difficulties. One approach would be to create a job corps or a community service program for which volunteers would be repaid, in part, by a civilian equivalent of the GI Bill. A second approach, would be to reemphasize the importance of the National Guard as a standing militia. High school graduates might enlist for service in the National Guard rather than the Armed Forces, be asked to participate for a reasonably long period of time, and then be repaid immediately by stipends and access to scholarships. Finally, if advanced education is as critical for employment today as recent studies suggest (Parnell 1985; Johnson and Packer 1987; Aerospace Education Foundation 1989), then it may be time for policy makers to consider some approximation of compulsory post-secondary education. In this regard, apprenticeship programs that link high school students to community college programs seem to have considerable promise. Whatever steps are taken, policy makers must formulate their decisions in light of the realization that reductions in military personnel are likely to increase the unemployment rate among minorities. *Policies ought to be fashioned to create alternative forms of employment as well as alternative sources of training.*

Endnotes

[1] In 1991, 640,098 persons graduated with "associate's degrees and other awards based on post-secondary curriculums (sic) of less than 4 years in institutions of higher education." (Department of Commerce 1992, 164).

[2] Most studies prior to those summarized in Table 1 focused on the earnings of men and women who retired from military careers rather than on servicemen and women who served shorter tours of duty. Given that the policy debate does not concern those who pursue full-term careers in the military, I have restricted my attention to studies relevant to the average recruit.

[3] Percentages are derived from Villemez and Kasarda (1976), Table 2.

[4] This figure represents half the number of servicemen and women discharged in 1991.

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